

REMARKS

Claims 13-27 are pending in the application. Claim 13 has been amended to change "adjacent to" with "contact with" based on, for example, on pages 7-8 of the specification.

Entry of the above amendments is respectfully requested.

I. Response to Rejection of Claims 16 and 22-26 under 35 U.S.C. § 112, second paragraph

Claims 16 and 22-26 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

Specifically, the Examiner asserts that claim 13 mentions a second electrode being made of a catalyst for accelerating cathodic reduction and claim 16 mentions a cathodic catalyst, and that it is unclear as to whether this is the catalyst mentioned in claim 13 [sic] or a second catalyst layer. In addition, the Examiner asserts that claim 16 further cites a platinum group catalyst and it is unclear as to whether this is a second platinum group catalyst or the platinum group catalyst mentioned in claim 13.

Applicants respectfully traverse the rejection.

To meet the requirements of § 112, second paragraph, the claims must be sufficiently definite for one to reasonably determine their scope. MPEP § 706.03(d).

It is respectfully submitted that, as currently written, the limitations of claim 16 is definite. Claim 16 recites "a mixed layer including an electronic conductivity base material, a solid electrolyte film, a platinum group catalyst and a cathodic catalyst is provided between the conductive solid electrolyte film and the second electrode." Thus, it is clear that claim 16 recites an additional element, a mixed layer, which comprises an electronic conductivity base material, a solid electrolyte film, a platinum group catalyst and a cathodic catalyst. The mixed layer is provided between the conductive solid electrolyte film and second electrode recited in

claim 13. Accordingly, the cathodic catalyst of claim 16 is not the cathodic catalyst of claim 13 and the platinum group catalyst of claim 16 is not the platinum group catalyst of claim 13.

In addition, the specification describes the mixed layer of claim 16 at pages 14-15 of the specification. Specifically, the specification discloses that:

A nitrogen oxide decomposing element of embodiment 2 (not shown) is such that a mixed layer including an electronic conductivity base material, a solid electrolyte film, a platinum group catalyst and a cathodic catalyst is disposed between the solid electrolyte film 2 of the nitrogen oxide decomposing element 1 (see Fig. 1) of embodiment 1 and the second electrode 4 and is brought into close contact therewith. This mixed layer can be formed by dispersing a platinum group catalyst, a cathodic catalyst, a fine-grained electronic conductivity base material, and a fine-grained solid electrolyte film into a solution, heating them to evaporate volatile components, and combining the fine grain components with each other.

Therefore, it is respectfully submitted that one of skilled in the art would be apprised of the scope of the invention and that the claims comply with §112, second paragraph.

Accordingly, withdrawal of the rejection is respectfully requested.

II. Response to Rejection of Claims 13, 14, 16 and 19-24 under 35 U.S.C. § 102(b)

Claim 13, 14, 16, and 19-24 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Kobayashi et al. (US 5,352,337).

Applicants respectfully traverse the rejection.

Claim 13 is directed to a nitrogen oxide decomposing element, comprising: a conductive solid electrolyte film for selectively allowing a hydrogen ion to pass through; a first electrode made of an electronic conductivity base material disposed on a part of a surface of the conductive solid electrolyte film and a catalyst for accelerating anodic oxidation; a second electrode made of an electronic conductivity base material disposed on the other part of the surface of the conductive solid electrolyte film and a catalyst for accelerating cathodic reduction; and a platinum group catalyst supported by a porous metal oxide disposed to be contacted with the second electrode. Thus, the present invention according to claim 13 has the

following features:

1. A platinum group catalyst supported by a metal oxide is combined to an element structure including a conductive solid electrolyte film, a first electrode disposed on a part of a surface of the conductive solid electrolyte film and a second electrode disposed on the other part of the surface thereof;
2. The metal oxide is made of a porous metal oxide; and
3. The porous metal oxide is disposed to be contacted with the second electrode.

It is respectfully submitted that Kobayashi does not disclose the above features.

First, Kobayashi does not a platinum group catalyst supported by a metal oxide is combined to an element structure including a conductive solid electrolyte film, a first electrode disposed on a part of a surface of the conductive solid electrolyte film and a second electrode disposed on the other part of the surface thereof. In the nitrogen oxide decomposing element according to claim 1, a nitrogen oxide is decomposed by two kinds of reactions as, for example, described on page 11, lines 15-23 of the specification. In the first reaction, the nitrogen oxide is decomposed by the chemical reductive reaction represented by, for example, the chemical formulas 8-11 described on page 9, line 23 to page 10, line 3 of the specification, in which only molecules are involved. In the second reaction, the nitrogen oxide is decomposed by the electrochemical reactive reaction represented by, for example formulas 1-7 described at page 9 or formulas 12-17 described at page 19 of the specification. In the nitrogen oxide decomposing element according to claim 1, the nitrogen oxide is decomposed by the two reactions and the decomposing capability for the nitrogen oxide is increased.

Second, in the nitrogen oxide decomposing element according to claim 1, the metal oxide is made of a porous metal oxide. Kobayashi does not disclose that the metal oxide is made of a porous metal oxide. The porous metal oxide supports the platinum group catalyst

since the porous metal oxide has an increased large surface and supports the platinum group catalyst at the increased large surface. The catalyst reaction is enforced and the decomposing capability is increased.

Third, in the nitrogen oxide decomposing element of claim 1, the porous metal oxide is disposed to be contacted with the second electrode. Kobyashi does not disclose this feature. In the second reaction, the hydrogen molecule produced on the second electrode and nitrogen oxide react with each other by the action of the platinum group catalyst according to, for example, chemcial formulas 8-11 of the specification. As a result of the structure in which the porous metal oxide is disposed to be contacted with the second electrode, the second reaction is produced at a higher efficiency. Therefore, the decomposing capability is increased.

Hence, it is respectfully submitted that claim 1 is not anticipated by Kobayashi for at least the above reasons.

In addition, each of claims 14, 16, and 19-24 depend directly or indirectly from claim 1, and thus, it is respectfully submitted that these claims are patentable for at least the same reasons as claim 1.

In view of the above, withdrawal of the rejection is respectfully requested.

III. Response to Rejections of Claims under 35 U.S.C. § 103(a)

Claim 15 and 22-24 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi et al. further in view of Nakagawa et al. (JP 08-168673).

Claims 17 and 18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi in view of Yokota et al. (JP 07-24613).

Claims 25 and 26 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi and Yokota, and further in view of Oshima et al. (US 5,272,871).

Claims 25 and 26 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi and Nakagawa, and further in view of Oshima.

Claims 25 and 26 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi, and further in view of Oshima.

Applicants respectfully traverse the rejections.

Claims 15, 17-18, and 22-26 depend directly or indirectly from claim 13, and thus, it is respectfully submitted that these claims are patentable over the cited art for at least the same reasons as claim 13. In addition, the secondary references do not make up for the deficiencies of Kobayashi.

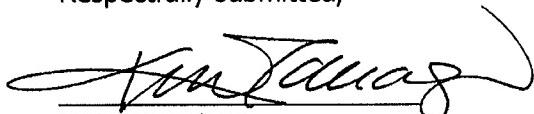
In view of the above, withdrawal of the rejections is respectfully requested.

IV. Conclusion

For the foregoing reasons, reconsideration and allowance of claims 13-26 is respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: November 9, 2007